

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A system for delivering a fastener to a work station, said system comprising:

at least one fastener storage device including at least one storage tube;

at least one fastener spacer adapted to properly orient at least one fastener stored in the storage tube; and

at least one unloading mechanism including at least one extractor catcher, the unloading mechanism adapted to remove the spacer and the fastener from the storage tube in a single operation.

2. (original) The system of Claim 1, wherein the unloading mechanism is further adapted to:

retain the fastener within the extractor catcher; and

substantially simultaneously transport the spacer to a spacer storage receptacle, via spacer transport tube.

3. (original) The system of Claim 2, wherein the unloading mechanism is adapted to utilize a vacuum force that retains the fastener in the extractor catcher and transports the spacer through the extractor catcher and an extractor tube coupled to the extractor catcher.

4. (original) The system of Claim 3, wherein the unloading mechanism includes at least one vacuum means adapted to create the vacuum force that retains the fastener in the extractor catcher and transports the spacer through the extractor catcher and an extractor tube coupled to the extractor catcher.

5. (original) The system of Claim 3, wherein the vacuum generator is further adapted to create a vacuum exhaust that propels the spacer through the spacer transport tube into the storage receptacle.

6. (original) The system of Claim 3, wherein the vacuum generator includes at least one intake port to facilitate retaining the fastener in the extractor catcher while the spacer is transported to the storage receptacle.

7. (original) The system of Claim 3, wherein the spacer is further adapted to have an outside diameter that is sized to allow the spacer to pass through the extractor catcher, the extractor tube, the vacuum generator, and the spacer transport tube to be deposited in a storage receptacle.

8. (original) The system of Claim 3 wherein the extractor catcher includes a chamfered opening in a first end that leads into a channel connecting the opening to a recess in a second end of the extractor catcher, wherein the chamfered opening is adapted to facilitate removing the spacer and fastener from the storage tube, and to allow the spacer to pass through the extractor catcher while retaining the fastener therein.

9. (original) The system of Claim 8, wherein the extractor catcher further includes at least one intake port adapted to allow air to be drawn into the extractor catcher after the fastener has been stopped by the chamfered opening, thereby allowing the vacuum force to transport the spacer through the extractor catcher and the extractor tube where the vacuum exhaust propels the spacer through the spacer transport tube to the storage receptacle.

10. (original) The system of Claim 3, wherein the extractor catcher includes an opening in a first end that includes a first chamfered portion adapted to facilitate removing the spacer and fastener from the storage tube.

11. (original) The system of Claim 10, wherein the opening further includes a second chamfered portion that leads into a channel connecting the opening to a recess in a second end of the extractor catcher opposite the opening, the second chamfered portion adapted to allow the spacer to pass through the extractor catcher while retaining the fastener therein.

12. (original) The system of Claim 11, wherein the extractor catcher further includes at least one intake port adapted to allow air to be drawn into the extractor catcher after the fastener has been stopped by the second chamfered portion, thereby allowing the vacuum force to transport the spacer through the extractor catcher and the extractor tube where the vacuum exhaust propels the spacer through the spacer transport tube to the storage receptacle.

13. (original) The system of Claim 1, wherein the spacer includes a recess adapted to loosely fit around a tail end of a mandrel of the fastener.

14. (original) The system of Claim 13, wherein the recess includes a chamfered upper portion adapted to provide a self-locating feature such that when the spacer is dropped into the storage tube after a fastener has been inserted into the storage tube, the tail end of the mandrel is positioned within the recess without manipulating the fastener and the spacer.

15. (original) The system of Claim 13, wherein the recess is adapted to have depth that extends a substantial distance into the spacer such that an end wall of the spacer creates only a slight separation between the tail end of a mandrel of a first fastener in the storage tube and a head end of the mandrel of an adjacent fastener in the storage tube, thereby allowing more fasteners to be stored in the storage tube.

16. through 22 (cancelled)

23. (currently amended) An unloading apparatus for a fastener delivery system, said apparatus comprising:

at least ~~[[on]]~~ one extractor tube in communication with a vacuum source that provides a vacuum force utilized by the unloading apparatus to substantially simultaneously remove a fastener and a fastener spacer from a storage device; and

at least one extractor catcher coupled the extractor tube, wherein the extractor catcher is adapted to retain the fastener while substantially simultaneously allowing a fastener spacer to be transported to a spacer storage receptacle.

24. (original) The apparatus of Claim 23, wherein the vacuum source comprises at least one vacuum generator coupled to the extractor tube.

25. (original) The apparatus of Claim 24, wherein the vacuum generator includes at least one intake port to facilitate retaining the fastener in the extractor catcher while the spacer is transported to the storage receptacle.

26. (original) The apparatus of Claim 23 wherein the extractor catcher includes a chamfered opening in a first end that leads into a channel connecting the opening to a recess in a second end of the extractor catcher, wherein the chamfered opening is adapted to facilitate removing the spacer and fastener from the storage device, and to allow the spacer to pass through the extractor catcher while retaining the fastener therein.

27. (original) The apparatus of Claim 26, wherein the extractor catcher further includes at least one intake port adapted to allow air to be drawn into the extractor catcher after the fastener has been stopped by the chamfered opening, thereby allowing the vacuum force to transport the spacer through the extractor catcher and the extractor tube where a vacuum exhaust propels the spacer through a spacer transport tube to the storage receptacle.

28. (original) The apparatus of Claim 23, wherein the extractor catcher includes an opening in a first end that includes a first chamfered portion adapted to facilitate removing the spacer and fastener from the storage tube.

29. (original) The apparatus of Claim 28, wherein the opening further includes a second chamfered portion that leads into a channel connecting the opening to a recess in a second end of the extractor catcher opposite the opening, the second chamfered

portion adapted to allow the spacer to pass through the extractor catcher while retaining the fastener therein.

30. (original) The apparatus of Claim 29, wherein the extractor catcher further includes at least one intake port adapted to allow air to be drawn into the extractor catcher after the fastener has been stopped by the second chamfered portion, thereby allowing the vacuum force to transport the spacer through the extractor catcher and extractor tube where a vacuum exhaust propels the spacer through a spacer transport tube to the storage receptacle.

31. through 35 (cancelled)